

HNF-20082  
Revision 0

# Compliance Monitoring Report for Petroleum Contaminated Soil Associated with Underground Storage Tanks 400-FS-40 and 400-FS-41

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C J Clement, Fluor Hanford

March 2004

Prepared for the U S. Department of Energy  
Assistant Secretary for Environmental Management**Fluor Hanford**P.O. Box 1000  
Richland, WashingtonContractor for the U S. Department of Energy  
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**Compliance Monitoring Report for Petroleum  
Contaminated Soil Associated with Underground Storage  
Tanks 400-FS-40 and 400-FS-41**

**U. S. Department of Energy  
Richland Operations Office  
March 2004**

**Prepared by  
Fluor Hanford, Inc.**

## Executive Summary

In May of 1994, underground storage tanks (USTs) 400-FS-40 and 400-FS-41, located south of the fire station in the 400 area of the Hanford Site in Benton County, Washington, were removed. Subsequent to the removal of the USTs, petroleum contaminated soil (PCS) was discovered at the excavation site. The PCS was excavated and the site sampled to verify cleanup. Those actions are described in the *Site Characterization Report for the United States Department of Energy Underground Storage Tanks 400-FS-40 and 400-FS-41*, submitted to the State of Washington Department of Ecology (Ecology) in July of 1994 (ref. 1)

The removed PCS was placed into a plastic lined, bermed bioremediation pit, located nearby the tank excavation site. On September 26, 1996, eight samples were taken. Diesel was detected above the then Method A cleanup levels specified in Chapter 173-340 of the Washington State Administrative Code (WAC 173-340), *Model Toxics Control Act Cleanup Regulation* (MTCA) in 5 samples and heavy oil in one sample. Those results are discussed in the *Site Assessment Report for the Hanford Site 400 Area Soil Cell*, submitted to Ecology on May 21, 1996 (ref. 2). On April 26, 2001, the bioremediation area was resampled to verify remediation had occurred. All eleven samples showed total petroleum hydrocarbon (TPH) in the diesel and heavy oil range to be below the detection limit. Accordingly, this site has completed the corrective action under WAC 173-360

## 1.0 Purpose and Objective

This report has been prepared to show that the cleanup of the 400 Area Soil Cell has been achieved per the corrective action requirements of the Chapter 173-360 of the Washington Administrative Code (WAC 173-360), *Underground Storage Tank Regulations*.

## 2.0 Background

The 400 Area Soil Cell is located within the south eastern portion of the 400 area the Hanford site, Benton County, Washington, nearby the 400 area Fire Station. The bioremediation area was used to actively bioremediate petroleum contaminated soil that was discovered and excavated subsequent to the removal of two underground storage tanks (USTs) in the 400 area. The two USTs, numbered 400-FS-40 and 400-FS-41, were associated with the 400 area Fire Station. The tanks were used to store unleaded gasoline and diesel fuel for the 400 area fire station.

USTs 400-FS-40 and 400-FS-41 were removed in May of 1994. PCS was discovered around the pump lines and removed. The remedial action for the site of USTs is discussed in the *Site Characterization Report for the United States Department of Energy Underground Storage Tanks 400-FS-40 and 400-FS-41*, previously submitted to Ecology on July 27, 1994 (ref 1).

The soils at the bioremediation area were initially sampled on September 25, 1995. The range of the results in the diesel range was from 49 to 380 mg/kg. The range of the results in the motor oil range was from <100 to 380 mg/kg. The results in the gasoline range were all <25 mg/kg. Those results were reported in the *Site Assessment Report for the Hanford Site 400 Area Soil Cell*, submitted to Ecology on July 27, 1994 (ref. 2).

The Waste Information Data system (WIDS) database identifies the UST site as "400-15, Diesel Fuel Tank Fitting Leak." While the 400 Area Soil Cell is not a WIDS site itself, it is discussed extensively in the WIDS "General Summary Report" of "400-15, Diesel Fuel Tank Fitting Leak."

## 3.0 Recent Sampling Results

The 400 Area Soil Cell was sampled again on April 26, 2001. Eleven samples were extracted from locations throughout the soil cell. These locations were selected at random per the criteria described in the *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* (Appendix 1). All eleven samples showed TPH levels in the diesel range below the method detection limit (MDL) of 25 mg/kg and below the MDL of 50 mg/kg for the motor oil extended range. The full analytical reports, including quality control data, are included in Appendix 2.

#### 4.0 Deviations from the Sampling Plan

Except as noted below, sampling was conducted per the requirements outlined in the attached *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* (Appendix 1).

The following deviations occurred

- The *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* prescribed depth of samples, in addition to the x and y coordinates. The depth coordinates were based on an assumption of an average soil depth to liner of 36 inches. This turned out to be an overestimation, with maximum depth actually only 24 inches and as low as 11 inches in some places. Therefore, the depth required in the *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* could not be attained for five of the eleven samples. For these five samples, samples were extracted as deep as possible, and the actual depth was recorded. The following table compares the actual depth of these five samples with the depth originally prescribed in the *Sampling and Analysis Plan for Closure of 400 Area Soil Cell*.

| Soil Sampling Depth |        |        |                              |                       |
|---------------------|--------|--------|------------------------------|-----------------------|
| Sample #            | X-Axis | Y-Axis | Sampling Plan Depth (inches) | Actual Depth (inches) |
| 400soil-07          | 52     | 2      | 30                           | 11                    |
| 400soil-08          | 2      | 29     | 34                           | 12                    |
| 400soil-09          | 3      | 44     | 30                           | 18                    |
| 400soil-10          | 41     | 56     | 33                           | 14                    |
| 400soil-11          | 46     | 41     | 31                           | 17                    |

- The *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* called for two field duplicates, based on requirements of the NWTPH-DX method for sets of samples between 11 and 20. However, only one field duplicate was taken. As documented in the Field Sampling Log included in Appendix 2, sample number 400soil-12 was a field duplicate of sample number 400soil-11. As shown in the analytical results, the results for these two samples were identical (both reported at below the MDL of 25 mg/kg and 50 mg/kg for diesel and motor oil, respectively). Given that no TPH was detected in any of the samples, the inadvertent omission of a second field duplicate is not considered to be significant.
- The *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* called for an equipment rinse sample to be taken and analyzed for NWTPH-Dx. As recorded on the Chain of Custody form in Appendix 2, two equipment rinse samples were taken - one a pre-rinse and one a post-rinse. However, as

recorded in the comments section of the analytical report in Attachment 2, the laboratory dropped the sample container with the post-rinse sample and was not able to retrieve any of the sample for analyses. Given that no TPH was detected in any of the soil samples, this is not considered to be a significant loss.

## 5.0 Data Analyses

The *Sampling and Analysis Plan for Closure of 400 Area Soil Cell* specified that the criteria from WAC 173-340-740(7)(e)<sup>1</sup> would be used to determine if the results meet cleanup standards. Since all the results were below the detection limit, this is a formality. For completeness, however, that analyses is described below.

The specific method used to evaluate compliance with the soil cleanup levels is a confidence interval approach that requires the following:

- A decision rule based on a one-tailed test of the null hypothesis that the true soil concentration exceeds the soil cleanup level.
- Statistical tests at a Type I error level of 0.05
- An upper confidence level on the true soil concentration less than the soil cleanup level
- No single concentration greater than two times the soil cleanup level
- Less than 10% of the samples exceeding the soil cleanup level

Statistical analysis of the sampling results for the 400 Area Soil Cell show that each criterion for considering the soil cell clean has been met. Statistical methods were performed in accordance with guidance found in the *Statistical Guidance for Ecology Site Managers* (ref. 3) and *Miller & Freund's Probability & Statistics for Engineers* (ref. 4).

WAC 173-340-740 describes how to handle sample results reported at below the MDL. For purposes of demonstrating compliance with soil cleanup levels, such measurements are to be reported at one-half the MDL. Therefore, for the purpose of the statistical methods described below, the results for all eleven samples are considered to be 12.5 mg/kg and 25 mg/kg for diesel and motor, respectively (one-half the MDL).

### Testing of the Null Hypothesis

The null hypothesis is that the true soil concentration exceeds the soil cleanup level of 200 mg/kg. If it can be shown through statistical analysis that the null hypothesis is unlikely, then the alternate can be accepted, which is that true soil concentrations are below the cleanup level. A Type I error would be a situation in

<sup>1</sup> This citation corresponds to MTCA prior to the February 12, 2001 amendments (effective on August 15, 2001). This is allowed by the current MTCA regulations under WAC 173-340-702(12)(b).

which the area is considered to be clean, when in fact it is really above the cleanup level. Statistical analysis must be able to show that the chance of rejecting the null hypothesis when it is in fact correct is no more than 5%, or 1 in 20.

Per Miller & Freund, the null hypothesis can be rejected if  $Z < Z\alpha$ , where

$$Z = \frac{\bar{X} - \mu_0}{\sigma/\sqrt{n}} \quad \text{and,}$$

$$\alpha = 0.05$$

$\bar{X}$  = sample mean, or 12.5 mg/kg for diesel

$\mu_0$  = null hypothesis number, or 200 mg/kg

$\sigma$  = sample standard deviation (0 in this case since all values were the same)

$n$  = number of samples (11 in this case)

The formula thus becomes,

$$Z = \frac{12.5 \text{ mg/kg} - 200 \text{ mg/kg}}{0/\sqrt{11}}$$

Given that there is a zero in the denominator<sup>2</sup>, the answer is,

$$Z = 0$$

The value for  $Z_{0.05}$  is 1.645 for a one-sided test, as given in Table 3 of reference 4. Since  $Z(0)$  is less than  $Z\alpha(1.645)$ , we can reject the null hypothesis that the true soil concentration exceeds the cleanup level.

#### Determining the Upper Confidence Limit

The guidance requires the 95% Upper Confidence Interval (UCL) to be below the cleanup level of 200 mg/kg. Stated otherwise, this means that the true soil population will be under the UCL 95% of the time.

<sup>2</sup> This would also be true for the motor oil range.



The UCL is defined in Ecology's Statistical Guidance as,

$$UCL = \bar{x} + t_{1-\alpha, n-1} \text{ degrees of freedom } s/\sqrt{n}, \text{ where:}$$

$\bar{x}$  = sample mean (12.5 mg/kg for diesel in this case)

$t_{1-\alpha, n-1} \text{ degrees of freedom}$  = 1.812, as given in Table 4 of reference 4

$s$  = standard deviation (0 in this case since all results are the same)

$n$  = number of samples (11 in this case)

The formula thus becomes,

$$UCL = 12.5 \text{ mg/kg} + 1.812 \times 0/\sqrt{11}, \text{ or}$$

$$UCL = 12.5 \text{ mg/kg (since there is a zero in the numerator)}$$

Therefore, this criterion is met, since 12.5 mg/kg<sup>3</sup> is less than cleanup level of 200 mg/kg.

#### Other Criteria

The two remaining criteria that must be satisfied are obviously met, given that all values were reported at below the MDL. If all values are read as 12.5 mg/kg for diesel and 25 mg/kg for motor oil, then it is clear that no single value was greater than the soil cleanup level of 200 mg/kg, and that not more than 10% of the results exceeded this limit.

## 6.0 Conclusions and Future Actions

Using WAC 173-340 as the cleanup standard, the bioremediation area has met the corrective action requirements of WAC 173-360. The bioremediation area is also considered closed under WAC 173-304. The soil will be reused onsite (e.g., as fill or cover). The closure of the bioremediation area should now allow the WIDS site "400-15, Diesel Fuel Tank Fitting Leak" to also be closed out in WIDS.

<sup>3</sup> The result would be 25 mg/kg for motor oil, which is also less than 200 mg/kg

## 7.0 References

- 1 Letter, S. H. Wisness, RL, to S. M. Alexander, Ecology, "Underground Storage Tank 400-FS-40 and 400-FS-41 Closure Form and Site Assessment Report," 94-RPS-284, dated July 27, 1994
- 2 Letter, J. R. Rasmussen, RL, to S. M. Alexander, Ecology, "Site Assessment Report for the Hanford Site 400 Area Soil Cell," 96-EAP-107, dated May 21, 1996.
- 3 *Statistical Guidance for Ecology Site Managers*, 92-55, Washington State Department of Ecology Toxics Cleanup Program, August 1992
- 4 Johnson, Richard A., *Miller and Freund's Probability and Statistics for Engineers*, Prentice Hall, 1994

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Appendix 1

*Sampling and Analysis Plan for Closure of 400 Area Soil Cell,*  
April 2001

(12 pages, including cover page)

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**Sampling and Analysis Plan for Closure of  
400 Area Soil Cell**

**Prepared by R.A. Del Mar**

**DynCorp Tri-Cities Services, Inc.**

**April 2001**

## Sampling Plan for Closure of 400 Area Soil Cell

### 1.0 Purpose and Objective

This sampling plan is being prepared in accordance with the requirements of the Model Toxics Control Act (MTCA), WAC 173-340-820 (ref 1). Results from this sampling will be used to determine if total petroleum hydrocarbon (TPH) levels in the soil being treated in the 400 Area Soil Cell have decreased to below the Method A soil cleanup levels for TPH specified in WAC 173-340-740 (ref 2). The MTCA Method A cleanup levels are provided in Table 1.

| Table 1 - Method A Cleanup Levels for Total Petroleum Hydrocarbons |                  |
|--|------------------|
| Hazardous Substance  | Cleanup Level    |
| Total petroleum hydrocarbon (gasoline)                             | 100 mg/kg - soil |
| Total petroleum hydrocarbon (diesel)                               | 200 mg/kg - soil |
| Total petroleum hydrocarbon (other (heavier than diesel))          | 200 mg/kg - soil |

The 400 Area Soil Cell is located within the boundaries of the 400 Area of the Hanford Site in Benton County, Washington. The soil cell was used to stockpile petroleum-contaminated soil discovered during the removal of two underground storage tanks (400-FS-40 and 400-FS-41) in 1994. The soil was placed over a high-density polyethylene liner and is bermed on all four sides for an effective depth of approximately 3.5 feet, within a surface area of approximately 6,000 square feet.

The soil cell was last sampled in 1996 (ref 3). These results are given in Table 2. Eight samples were taken along two diagonal paths from the corner of the cell. No TPH in the gasoline range was detected, five of the eight samples detected TPH in the diesel range above 200 mg/kg, and one of the eight samples detected TPH in the heavy oil range.

| Table 2 - Previous Sampling Results |                  |                |                   |
|-------------------------------------|------------------|----------------|-------------------|
| Sample ID #                         | Gasoline - mg/kg | Diesel - mg/kg | Heavy Oil - mg/kg |
| 400-SOILCELL-1                      | <20              | 380            | 380               |
| 400-SOILCELL-2                      | <20              | 320            | <100              |
| 400-SOILCELL-3                      | <20              | 300            | <100              |
| 400-SOILCELL-4                      | <20              | 350            | <100              |
| 400-SOILCELL-5                      | <20              | 130            | <100              |
| 400-SOILCELL-6                      | <20              | 49             | <100              |
| 400-SOILCELL-7                      | <20              | 150            | <100              |
| 400-SOILCELL-8                      | <20              | 380            | <100              |

### 2.0 Organization/Responsibilities

Sampling will be performed by members of the DynCorp Tri-Cities Services, Inc. (DYN) Environmental Programs and Compliance (EPC) organization. At least two samplers will participate in this activity. Samplers will be trained in RCRA sampling protocols and responsibilities, and will be qualified to enter hazardous waste areas through OSHA 24-hr or 40-hr Hazardous Waste Operations (HAZWOPER) training, as required in 29 CFR 1910.120 (ref 4). EPC staff will also be responsible for maintaining chain-of-custody control of samples through delivery to the analytical laboratory.

Samples will be analyzed at the Hanford Site Waste Sampling and Characterization Facility (WSCF) located near Richland, Washington. The WSCF laboratory is accredited in the State of Washington to perform TPH analysis using both the NWTPH-GA and NWTPH-DA methods. If

for some reason the analysis cannot be performed at WSCF, WSCF will arrange for the shipment of the samples to Laucks Testing Laboratory in Seattle, also accredited for both the NWTPH-Gx and NWTPH-Dx methods. The laboratory will be responsible for performing analysis in accordance with all method requirements, including quality assurance/quality control protocols and for performing all data validation activities.

DYN EPC will interpret the analytical data and perform all statistical analysis required to show whether or not the soils will meet cleanup standards.

### 3.0 Sampling Requirements

3.1 The following serves as a checklist of the minimum-required sampling equipment to be used for this activity:

- Chain-of-custody form
- Field sampling log
- Hand shovel and trowel
- Latex gloves
- Recyclable shop towels
- Sample containers
- Sample labels
- Safety glasses
- Substantial footwear
- Cellular phone
- Sealable plastic bags
- Ice chest with blue ice
- Markers or flags to document location of samples
- Tape measure
- String and stakes to identify sampling points
- Hammer to drive in stakes
- Empty bucket for mixing soil
- Water/bucket for rinsing sampling equipment
- Water pump sprayer

#### 3.2 Identification/Justification for Sample Points

Sampling points are shown in Table 3. To ensure accuracy of the sampling data, locations were selected using a 3-dimensional random number generation tool provided as part of the Automatic Sampling and Analysis Planner software package (ref 5). The limits of the X- and Y-axis were 80 and 74 feet respectively. The depth of the soil cell is non-uniform, ranging from 2 to 3.5 feet. An average depth of 3 feet (36 inches) was used for purposes of calculating the Z (depth) coordinates.

The soil cell was mapped and an imaginary grid was created over the sampling area. Samples will be taken at the specified depth where the corresponding X and Y coordinates meet. Sampling points are charted in Table 4.

Based on an average soil depth of 3 feet, total volume of soil in the 400 Area Soil Cell is 17,760 cubic feet (637 cubic yards). Per Washington State Department of Ecology guidance contained in Guidance for Remediation of Petroleum Contaminated Soils (ref 6) a minimum of 7 samples need to be taken for this volume of soil. However, 11 samples will be taken in order to increase the precision of the data.



Table 3

## 2D/3D Sampling Grids

04/25/2000

14:42:19

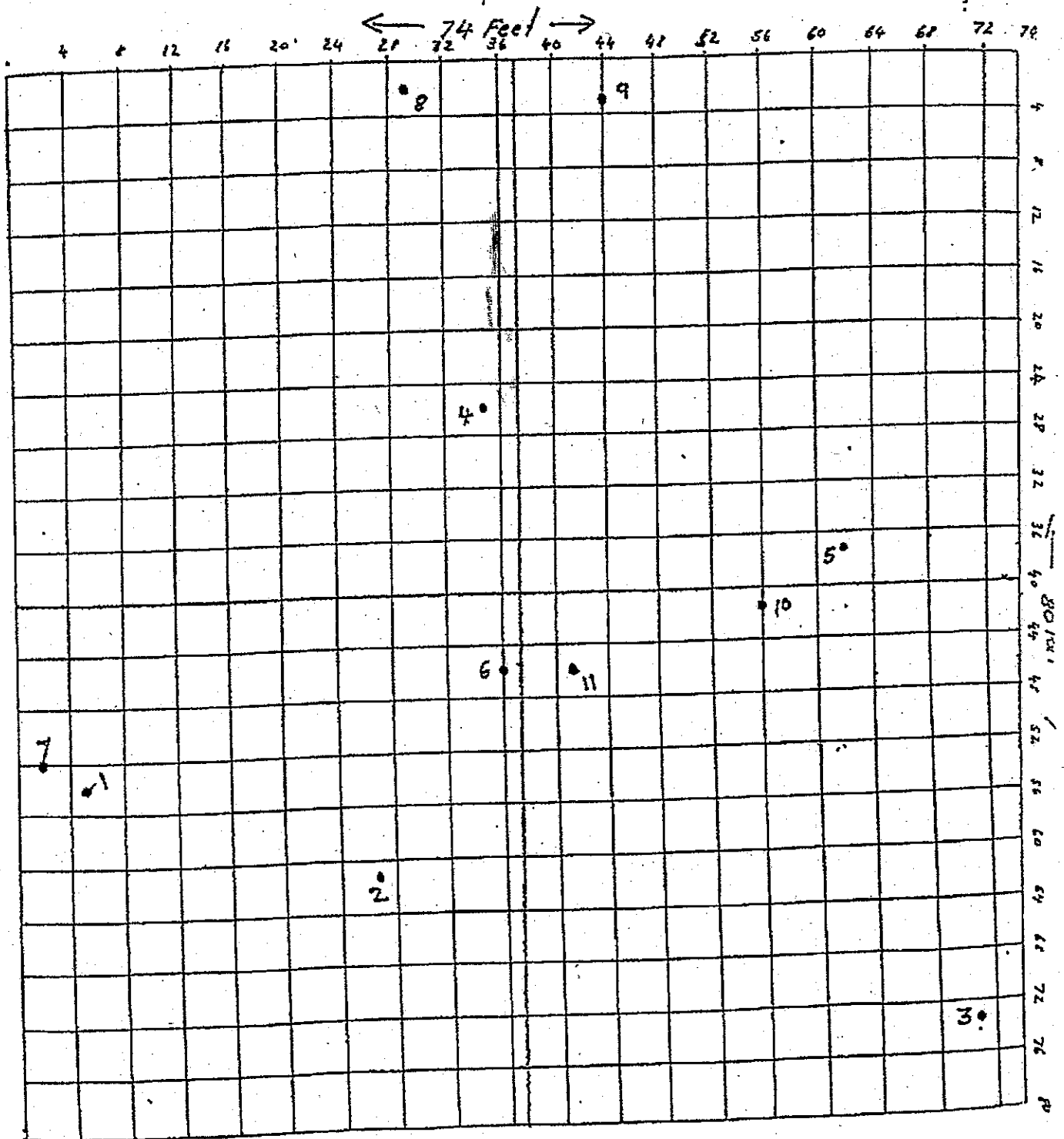
Project Label....: 400 AREA SOIL CELL

Data Set 3-D Unlayered

Unit (ft)

| Data Set | X-Axis | Y-Axis | Z(depth)-Coordinate (inches) |
|----------|--------|--------|------------------------------|
| 1        | 54     | 5      | 7                            |
| 2        | 61     | 27     | 18                           |
| 3        | 73     | 71     | 20                           |
| 4        | 26     | 35     | 1                            |
| 5        | 37     | 62     | 1                            |
| 6        | 45     | 36     | 8                            |
| 7        | 52     | 2      | 30                           |
| 8        | 2      | 29     | 34                           |
| 9        | 3      | 44     | 30                           |
| 10       | 41     | 66     | 33                           |
| 11       | 48     | 41     | 31                           |

Table 4  
Plot of Sampling Points for 400 Area Soil Cell





### 3.3 Method of Sampling

Samples will be extracted using a hand shovel

### 3.4 Sample Collection and Handling Requirements

A job-specific Automated Job Hazards Analysis (AJHA) has been prepared specific to this sampling activity to ensure that all risks/hazards are identified and planned for. Samplers will adhere to requirements outlined in the AJHA when entering soil cell area to take samples.

The sampling point X and Y coordinates will be measured off and marked at each side of the soil cell. String will be used to connect the markers at each opposite side of the soil cell. The intersection of the string for each respective sample coordinates will indicate the appropriate sampling location.

One shovel full of soil will be removed from each sampling point at the depth specified. The soil will be mixed in a bucket and a portion of that mixture will be placed in the sample container. The remaining soil will be returned to the sampling location. A minimum of 75 grams is required for each sample to run all required analysis. Samples will be collected in wide-mouthed 500-ml amber glass containers with Teflon lids. A flag-type marker indicating the corresponding sample identification number will be placed at each sample location.

The lid of the sample container will be hand-tightened, and the container will be labeled, wrapped in a plastic bag, and placed in an ice chest packed with blue ice packs.

Any residual soil remaining on the shovelhead will be physically removed before proceeding to the next sampling point. In addition, the shovelhead and mixing bucket will be rinsed in water and wiped down between each sample to prevent cross-contamination between sampling points. The rinse water will be sampled for TPH in the diesel range prior to and at the conclusion of sampling activities. Rinse water will be collected in 1L amber glass sample bottles and be preserved in the field with hydrochloric acid (HCL) to a pH of 2. Two 1L sample bottles will be required for each rinse water sample.

### 3.5 Management of Waste Generated by Sampling Activities

The sampling shovel/towel will be wet-wiped using a damp rag following sampling activities. Any loose dirt will be shaken off disposable gloves, rags, etc. used during sampling operations. Rags will be recyclable shop towels, and will be returned to the nearest recycling location. Other waste items will be sealed in a plastic bag with a non-regulated sticker and disposed of as non-regulated waste. This is justified because the soil constituents are known from previous sampling and even under a worst-case scenario where TPH levels are still the same, items contaminated with the soil would not, under any circumstance, designate as a dangerous waste.

Rinse water will be kept at a minimum and is not expected to exceed 5 gallons. At the completion of sampling, it will be disposed of through the 400 Area sanitary sewer system.

Soil samples will be retrieved from the laboratory within 30 days of receipt of satisfactory sampling results and be returned to the soil cell area.

### 3.6 Quality Assurance/Quality Control Requirements

A field log will be kept to document all pertinent information related to the sampling activity (see Field Sampling log in Appendix A). All entries in the log will be completed, including date and signature of the person completing the log.

Two duplicate samples will be collected to measure the precision of the sampling process, consistent with the guidance provided by Ecology in Analytical Methods for Petroleum Hydrocarbons (ref. 7). The duplicate will be collected from the same location and at the same time as other samples from two of the 11 identified sampling points. The duplicate will be collected in a separate sampling container with separate labeling, and will be analyzed independently. Prior to placing soil in sample containers, soil from each duplicate sampling location will be mixed to ensure a uniform distribution. The soil from the respective mixtures will then be transferred into the appropriate primary and duplicate sample containers. The identity of the duplicates will be kept from the laboratory to prevent bias in analyzing the results.

Samples will be preserved in the field by cooling in an ice chest packed with blue ice. Each individual sample container will be hand tightened and packaged separately in a sealable plastic bag prior to placing in the ice chest to prevent cross contamination. The sample shovel/trowel and mixing bucket will be rinsed in water and wiped down between each sample to prevent cross contamination. At the conclusion of sampling, one sample will be taken of the rinse water solution for TPH in the diesel range to measure the effectiveness of the rinse process. A sample will also be taken of the rinse water prior to sampling to provide a baseline for TPH levels in the rinse water. Rinse water sample bottles will be preserved with HCL.

To ensure that samples are as representative as possible of the soil in the cell area, sampling locations were selected using a random number generation program. The soil cell area was divided into quarters. The criterion used in acceptance of coordinates generated by the random generation program was that there be at least two samples in each of the four quarters. The program was rerun until coordinates were generated that met this criterion.

### 3.7 Sample Labeling and Chain-of-Custody Requirements

Each sample will be labeled with waterproof ink. The label will be affixed firmly to the appropriate sample container and include the following information:

- Name of collector
- Date and time of collection
- Place of collection
- Description of material being sampled (i.e., TPH-contaminated soil)
- Unique sample number corresponding to sample identification number on the chain-of-custody
- Specific analysis required
- Preservation requirements (i.e., cool to 4 degrees C  $\pm$  2 degrees)

All samples will be recorded on a chain of custody form. The primary purpose of the chain-of-custody form is to create a written record to trace the possession and handling of the sample from the moment of collection through analysis and eventual disposal. Hanford Site Form BC-6000-828 will be used to record the chain-of-custody.

The sample will remain in custody of the DYN EPC sampler through transfer to the analytical laboratory. A sample is in someone's custody under any of the following conditions:

- The sample is in one's actual possession
- The sample is within view, after being in one's physical possession
- The sample is in a locked area to prevent unauthorized personnel from tampering with it
- The sample is in a secured area, restricted to authorized personnel only

The following information will be recorded on the chain-of-custody:

- Name and address of analytical laboratory doing the analysis
- Name, address, phone number, and fax number of client (i.e., DYN EPC) contact person
- Billing information
- Required turnaround time
- Project name for future reference to help identify the sampling act, including name of personnel involved in sampling
- List of all unique sample identification numbers, description (i.e., size and type) of sampling container tied to each number, date and time sample was added to each container, and specific analysis requested for each
- Preservation and holding time requirements, as appropriate
- Under the comments section, list any project-specific information that might be useful to lab in running analysis, such as detection limit requirements, process knowledge, etc.

At the time of turnover to laboratory, DYN EPC sampler will sign and date chain-of-custody, including time of sample turnover. Laboratory representative will do the same, and make a copy of chain-of-custody to be retained by DYN EPC sampler. Original chain-of-custody will remain with sample throughout analytical process.

Should samples require shipment to an offsite laboratory, the sample collector will package ice chest to prevent shifting/movement of sample containers during transportation, including enough blue ice to maintain the samples at the desired temperature during transportation. Sample containers will be wrapped with strapping tape to ensure that the ice chest does not open during transportation. The chain-of-custody and appropriate shipping documentation will accompany the ice chest. Samples will be shipped offsite through the transportation organization at 1162 building.

**Note:** Based on previous sampling results, samples will not meet the definition of a DOT hazardous material in 49 CFR 171.8. In lieu of a shipping paper, an offsite property control form will be used (form number BC-6001-579).

#### 4.0 Sample Analysis and Reporting Requirements

##### 4.1 Detection Limit

Cleanup level requirements are given in Table 1. Based on previous sampling history, analysis will be limited to hydrocarbons in the diesel and heavy oil ranges using method NWTPH-DV. Applicable detection limits are as follows:

- 25 mg/kg for the diesel range
- 100 mg/kg for the heavy oil range

#### 4.2 Analytical Techniques and Procedures

Per Ecology guidance provided in Analytical Methods for Petroleum Hydrocarbons (ref 7), if the source of hydrocarbon contaminants is unknown, soil samples are to be screened using analytical method NWTPH-HCID. This method is a qualitative and semi-quantitative screen to determine the presence and type of petroleum products in the sample. However, since the type of petroleum hydrocarbon contamination is known from previous sampling, the screening step will be skipped and all soil samples will be analyzed for TPH in the diesel/heavy oil ranges using method NWTPH-DX.

All soil samples will be preserved at the laboratory at 4 degrees Celsius ( $\pm 2$  degrees Celsius) prior to extraction. The maximum holding time of the sample prior to extraction is 14 days.

#### 4.3 Quality Assurance/Quality Control Requirements

The prescribed analytical methods require one method blank for every 20 samples and two duplicates for every set of samples between 11 and 20. Two field duplicates will be provided since these methods preclude preparation of analytical duplicates. Appropriate extraction surrogates will be added to all samples and method blank. The surrogate recovery for all samples must be between 50% and 150%.

#### 4.4 Data Reporting/Validation Procedures

The laboratory will prepare a full report outlying all sample results. Non-detected analytes will be reported as less than the respective detection limit. A full quality control report will be generated, including reporting of surrogate recovery rates. Any samples outside of the prescribed surrogate recovery limits will be flagged and rerun. Preliminary results of sampling will be faxed to DYN sample point-of-contact as soon as they are available. The laboratory will validate all sample results through an internal quality assurance process. Validated results will be mailed to the DYN point-of-contact to become the official sampling record.

The criteria established in WAC 173-340-740 (7)(e) will be used to determine if the data meets cleanup standards. This criteria is as follows:

- The upper confidence interval of the soil sampling data must be less than the respective cleanup level requirements, as listed in Table 1. Statistical tests shall be performed at a Type I error level of 0.05.
- No single concentration can be greater than two times the respective cleanup level.
- Less than 10% of the samples can exceed the respective cleanup level.

The upper confidence interval of soil sampling data will be established using guidance provided by Ecology in Statistical Guidance for Ecology Site Managers (ref 8). As appropriate, the Ecology-issued statistical software package, MTCStat (ref. 9) will be used to analyze the data.

#### 5.0 References

1. Washington Administrative Code, WAC 173-340-820, Sampling and Analysis Plans
2. Washington Administrative Code, WAC 173-340-740, Soil Cleanup Standards
3. Hill, J. S., and D. L. Klages, Site Assessment for the Hanford Site 400 Area Soil Cell, correspondence # 9651893D, May 1996.

4 OSHA Regulations, 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response

5 Potomac-Hudson Engineering, Inc., Automated Sampling and Analysis Planner, User's Manual Version 1.0

6 Washington State Department of Ecology Toxics Cleanup Program, Guidance for Remediation of Petroleum Contaminated Soils, 91-30 (revised 11/95)

7 Washington State Department of Ecology Toxics Cleanup Program and the Ecology Environmental Laboratory, Analytical Methods for Petroleum Hydrocarbons, ECY 97-602, June 1997

8 Washington State Department of Ecology Toxics Cleanup Program, Statistical Guidance for Ecology Site Managers, 92-55, August 1992

9 Washington State Department of Ecology Toxics Cleanup Program, MTCASat 2.1

#### 6.0 Forms

BC-6000-828, Chain of Custody/Sample Analysis Request  
BC-6001-579, Offsite Property Control

#### Appendix A Field Sampling Log

Appendix A

Field Sampling Log

Date \_\_\_\_\_ Time Sampling Started \_\_\_\_\_ Time Sampling Completed \_\_\_\_\_

Location \_\_\_\_\_ Waste Stream/Material \_\_\_\_\_

Purpose of Sampling \_\_\_\_\_

Weather Conditions \_\_\_\_\_

Sampling Method \_\_\_\_\_

Where Sample(s) Taken From \_\_\_\_\_

Physical State of Waste/Material \_\_\_\_\_

Field Measurements \_\_\_\_\_ pH \_\_\_\_\_ Temp \_\_\_\_\_ Other \_\_\_\_\_

Waste Components/Concentrations (if known) \_\_\_\_\_

Sample Identification or Tracking Number \_\_\_\_\_

Container(s)

Analysis Required

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Field Observations \_\_\_\_\_

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|  |
|  |

Sample Collector(s) \_\_\_\_\_

HNF-20082  
Revision 0

## Appendix 2

### Analytical Data Package

*(Contents include DynCorp Field Sampling Log, Chain of Custody/Sample Analysis Requests, Generator Knowledge Information Form, WSCF Analytical Laboratory Report and Narrative for the Appended Data of the 400 Area Soils Project)*

(14 pages, including cover page)

**DynCorp Field Sampling Log**

Date 4/26/01 Time Sampling Started 8:30 Time Sampling Completed 10:00

Location 400 Area Fire Station Waste Stream/Material Soil

Purpose of Sampling Show soil cell has met MTCA cleanup standards for TPH in diesel range

Weather Conditions Sunny, breezy

Sampling Method shovel/heave (grab)

Where Sample(s) Taken From Random locations specified in sampling plan

Physical State of Waste/Material \_\_\_\_\_

Field Measurements: \_\_\_\_\_ pH \_\_\_\_\_ Temp. \_\_\_\_\_ Other \_\_\_\_\_

Waste Components/Concentrations (if known) \_\_\_\_\_

Sample Identification or Tracking Number 400 soil-01 through -14

Container(s)

Analysis Required

400 soil-01 through -12  
400 soil-13 and -14

Soil/NWTPH-DX<sup>#</sup>  
Equipment Rinse/NWTPH-DX<sup>#</sup>

# 11 and 12 are field duplicates  
# 13 is pre-rinse; 14 is post-rinse

Field Observations Overestimated depth to liner at 3 Feet. Maximum depth was actually only about 24 inches. Was not able to get down to depth specified in sampling plan for 5 samples (#'s 7, 8, 9, 10, 11). Actual sampling depth noted and will be recorded in final report.

Sample Collector(s) Ron Del Mar, Saul Martinez



# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No  
042601  
Page 1 of 2

|   |                                     |  |               |                 |
|---|-------------------------------------|--|---------------|-----------------|
| Collector<br>Ron Del Mar                                  | Contact/Requestor<br>Ron Del Mar    | Telephone No<br>376-2186                           | MSIN<br>G3-26 | FAX<br>372-1694 |
| IAF No.<br>na   | Sample Origin<br>400 Area Soil Cell | Purchase Order/Charge Code<br>183466- CA30 113 274 |               |                 |
| Project Title<br>Bioremediation Cell Cleanup Verification | Logbook No.<br>na                   | Ice Chest No.<br>na                                | Temp.         |                 |
| Shipped To (Lab)<br>ESCF                                  | Method of Shipment<br>Hand Carried  | Bill of Lading/Air Bill No.<br>na                  |               |                 |
| Protocol<br>Full QC                                       | Data Turnaround<br>30 days          | Offsite Property No<br>na                          |               |                 |

| Sample No. | Lab ID | * | Date    | Time | No./Type Container | Sample Analysis | Preservative |
|------------|--------|---|---------|------|--------------------|-----------------|--------------|
| 400soil-01 |        | S | 4/26/01 | 9:37 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-02 |        | S | 4/26/01 | 9:40 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-03 |        | S | 4/26/01 | 9:43 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-04 |        | S | 4/26/01 | 9:17 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-05 |        | S | 4/26/01 | 9:20 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-06 |        | S | 4/26/01 | 9:33 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-07 |        | S | 4/26/01 | 9:35 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-08 |        | S | 4/26/01 | 9:10 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-09 |        | S | 4/26/01 | 9:14 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |
| 400soil-10 |        | S | 4/26/01 | 9:23 | 1 x 500 ml aG      | NWTPH-Dx        | Cool         |

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No  
Sampling is to verify cleanup of diesel-contaminated soil below the MTCA standard of 200 mg/kg. Sampling of this area performed in 1996 showed TPH concentrations in the diesel range anywhere from 49 to 380 mg/kg.

## SPECIAL INSTRUCTIONS

Hold Time  
Holding time prior to extraction is 14 days.

|   |                           |                            |  |                            |                            |  |
|---|---------------------------|----------------------------|--|----------------------------|----------------------------|--|
| Relinquished By<br>Print<br>R. Del Mar  | Sign<br><i>R. Del Mar</i> | Date/Time<br>4/26/01 11:10 | Received By<br>Print<br><i>[Signature]</i> | Sign<br><i>[Signature]</i> | Date/Time<br>4/26/01 11:10 | <p>Matrix</p> <p>S = Soil DS = Drum Solids<br/>SE = Sediment DL = Drum Liquids<br/>SO = Solid T = Tissue<br/>SL = Sludge WM = Wipe<br/>W = Water L = Liquid<br/>O = Oil V = Vegetation<br/>A = Air X = Other</p> |
| Relinquished By   |                           | Date/Time                  | Received By                                |                            | Date/Time                  |  |
| Relinquished By   |                           | Date/Time                  | Received By                                |                            | Date/Time                  |  |
| Relinquished By   |                           | Date/Time                  | Received By                                |                            | Date/Time                  |  |
| <p>FINAL SAMPLE DISPOSITION</p> <p>Disposal Method (e.g., Return to customer, per lab procedure, used in process)</p> |                           |                            | <p>Disposed By</p> <p>Date/Time</p>        |                            |                            |  |

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin  
DISTRIBUTION: 100% (100% of samples)

C.O.C. No. 042601

Page 2 of 2

[illegible]

Holding time prior to  
extraction is 14 days.

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin



**WSCE**  
**ANALYTICAL LABORATORY REPORT**

for

**DYNCORP TRI-CITIES SERVICES, INC.**  
**P.O. BOX 1400**  
**G3-26**  
**RICHLAND WA 99352**

**Attention: Ron Del Mar G3-26 FX 2-1694**

Report#: 20010610  
Report Date: 29-may-2001  
Report W004/ver. 3.1  
DYNCORP TRI-CITIES SERVICES, INC.

# WSCF

## ANALYTICAL LABORATORY REPORT

Attention:  
Project Number

Ron Del Mar G3-26 FX 2-1694  
DYNCORP WSTE:DYNCORP WASTE PROJECTS

Group #: 20010610

| Sample # | Client ID  | Test Performed | Matrix                         | Method RQ | Result        | Units       | MDL   | Analyzed | Sampled  | Received |          |
|----------|------------|----------------|--------------------------------|-----------|---------------|-------------|-------|----------|----------|----------|----------|
| DC00056  | 400SOIL-01 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00057  | 400SOIL-02 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00058  | 400SOIL-03 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/23/01 | 04/26/01 | 04/26/01 |
| DC00059  | 400SOIL-04 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00060  | 400SOIL-05 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00061  | 400SOIL-06 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00062  | 400SOIL-07 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/23/01 | 04/26/01 | 04/26/01 |
| DC00063  | 400SOIL-08 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00064  | 400SOIL-09 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/23/01 | 04/26/01 | 04/26/01 |
| DC00065  | 400SOIL-10 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/23/01 | 04/26/01 | 04/26/01 |
| DC00066  | 400SOIL-11 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00067  | 400SOIL-12 | DEL MAR        | Total Pet. Hydrocarbons Diesel | SOLID     | WTPH-D (WDOE) | <25         | mg/kg | 25.00    | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00068  | 400SOIL-13 | DEL MAR        | Total Pet. Hydrocarbons Diesel | WATER     | WTPH-D (WDOE) | <0.5        | mg/L  | 0.50     | 05/04/01 | 04/26/01 | 04/26/01 |
| DC00069  | 400SOIL-14 | DEL MAR        | Total Pet. Hydrocarbons Diesel | WATER     | WTPH-D (WDOE) | See Comment | mg/L  | 0.50     | 05/24/01 | 04/26/01 | 04/26/01 |

MDL=Minimum Detection Limit

RQ=Result Qualifier

B - The analyte was detected in the associated method blank

E - Compound concentration exceeded calibration range

N - Identification is based on a mass spectral library search

D - Compound concentration resulted from a dilution

J - Estimated value

Z - See Comments

U - The analyte was analyzed for but not detected

\* - Indicates results that have NOT been validated

Report W004/ver. 3.1

DYNCORP TRI-CITIES SERVICES, INC.

**WSCF**  
**ANALYTICAL COMMENT REPORT**

Attention:  
Project Number

Ron Del Mar G3-26 FX 2-1694  
DYNCORP WSTE

Group #: 20010610

Sample # Client ID

Lab Area

Test

Comment

VALGROUP

TPHD The extract for sample DC58 was lost due to glassware breakage. No sample for repeat was available because the second sample bottle was used for the matrix spike dup. analysis. Since the recovery of the MSD was 103%, the unspiked sample could not have contained a detectable amount of diesel. cgo

Soil samples DC58, DC62, DC64, DC65 required re-extraction and re-analysis due to below specification surrogate recovery. The surrogate recovery for the re-analysis passes QC acceptance criteria. cgo

Lab Areas: VALGROUP - Group Validation  
LOGSAMP - Login for Sample

VALTEST - Test Validation  
LOGTEST - Login for Tests

TESTDATA - Test Data Entry

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29-may-2001 07:11:32

W13g Worklist/Batch/QC Report for Group# 20010610

| WL#   | S# | Batch | QC#   | Tray Type | Sample#    | Test                         |
|-------|----|-------|-------|-----------|------------|------------------------------|
| 14690 | 1  | 15074 | 17050 | BLANK     |            | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 2  | 15074 | 17050 | LCS       |            | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 3  | 15074 | 17050 | SAMPLE    | W01DC00056 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 4  | 15074 | 17050 | SAMPLE    | W01DC00057 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 5  | 15074 | 17050 | SAMPLE    | W01DC00058 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 6  | 15074 | 17050 | SAMPLE    | W01DC00059 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 7  | 15074 | 17050 | SAMPLE    | W01DC00060 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 8  | 15074 | 17050 | SAMPLE    | W01DC00061 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 9  | 15074 | 17050 | SAMPLE    | W01DC00062 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 10 | 15074 | 17050 | SAMPLE    | W01DC00063 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 11 | 15074 | 17050 | SAMPLE    | W01DC00064 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 13 | 15074 | 17050 | MS        | W01DC00065 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 14 | 15074 | 17050 | MSD       | W01DC00065 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 12 | 15074 | 17050 | SAMPLE    | W01DC00065 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 14 | 15074 | 17050 | SPK-RFD   | W01DC00065 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 15 | 15074 | 17050 | SAMPLE    | W01DC00066 | WTPH-D TPH Diesel Range (Wa) |
| 14690 | 16 | 15074 | 17050 | SAMPLE    | W01DC00067 | WTPH-D TPH Diesel Range (Wa) |
| 14691 | 1  | 15076 | 17051 | BLANK     |            | WTPH-D TPH Diesel Range (Wa) |
| 14691 | 2  | 15076 | 17051 | LCS       |            | WTPH-D TPH Diesel Range (Wa) |
| 14691 | 4  | 15076 | 17051 | MS        | W01DC00068 | WTPH-D TPH Diesel Range (Wa) |
| 14691 | 3  | 15076 | 17051 | SAMPLE    | W01DC00068 | WTPH-D TPH Diesel Range (Wa) |
| 14691 | 5  | 15076 | 17051 | MSD       | W01DC00069 | WTPH-D TPH Diesel Range (Wa) |
| 14691 | 6  | 15076 | 17051 | SAMPLE    | W01DC00069 | WTPH-D TPH Diesel Range (Wa) |

# WSCF ANALYTICAL LABORATORY QC REPORT

SDG Number: 20010610  
Matrix: SOLID  
Test: WTPH-D TPH Diesel Range (Wa)

SAF Number: N/A  
Sample Date: 04/26/01  
Receive Date: 04/26/01

| QC Type   | Analyte                        | CAS # | Results | Units   | Analysis Date | Lower Limit | Upper Limit |
|---|--------------------------------|-------|---------|---------|---------------|-------------|-------------|
| Lab ID: W01DC00065<br>BATCH QC ASSOCIATED WITH SAMPLE |                                |       |         |         |               |             |             |
| MS  | Total Pet. Hydrocarbons Diesel |       | 120 000 | % Recov | 05/24/01      | 75 000      | 125 000     |
| MSD   | Total Pet. Hydrocarbons Diesel |       | 110 000 | % Recov | 05/04/01      | 75 000      | 125 000     |
| SPK-RPD   | Total Pet. Hydrocarbons Diesel |       | 2 895   | RPD     | 05/04/01      | 0 000       | 20 000      |
| BATCH QC  |                                |       |         |         |               |             |             |
| BLANK   | Total Pet. Hydrocarbons Diesel |       | 0       | mg/L    | 05/24/01      | 0 000       | 300 000     |
| LCS   | Total Pet. Hydrocarbons Diesel |       | 105 000 | % Recov | 05/24/01      | 80 000      | 120 000     |
| Lab ID: W01DC00068<br>BATCH QC ASSOCIATED WITH SAMPLE |                                |       |         |         |               |             |             |
| MS  | Total Pet. Hydrocarbons Diesel |       | 95 515  | % Recov | 05/24/01      | 75 000      | 125 000     |
| Lab ID: W01DC00069<br>BATCH QC ASSOCIATED WITH SAMPLE |                                |       |         |         |               |             |             |
| MSD   | Total Pet. Hydrocarbons Diesel |       | 103 714 | % Recov | 05/24/01      | 75 000      | 125 000     |
| BATCH QC  |                                |       |         |         |               |             |             |
| BLANK   | Total Pet. Hydrocarbons Diesel |       | <0.5    | mg/L    | 05/24/01      | 0 000       | 300 000     |
| LCS   | Total Pet. Hydrocarbons Diesel |       | 102 500 | % Recov | 05/24/01      | 80 000      | 120 000     |

## NARRATIVE FOR THE APPENDED DATA OF THE 400 AREA SOILS PROJECT

Fluor Hanford Company  
P O Box 1970  
Richland, Wa 99352

April 10, 2001

Attention Ron Del Mar

|                   |                               |
|-------------------|-------------------------------|
| Project           | 400 AREA Soils                |
| Number of Samples | Fourteen                      |
| Sample type       | 12 Soils and 2 Aqueous Liquid |
| SDG Number        | 200100610 (WSCF Group #)      |
| Data Deliverable  | Summary                       |
| Report Date       | January 9, 2004               |

### I Introduction

Twelve Soil and two aqueous samples were analyzed for Total Petroleum Hydrocarbons-diesel on May 4, 2001 and May 23, 2001. On December 12, 2003, an email from the client, Ron Del Mar of Environmental Field Services was received inquiring whether extended motor oil results could be extracted from original analyses in May of 2001. The original request for analysis requested only the diesel analyses, therefore only the diesel results were submitted in the original Labcore (Laboratory Information Management System) LIMS final report.

The original raw data were retrieved from the data archive and reviewed to ascertain whether chromatographic conditions were appropriate to extract motor oil results from the raw data. This review indicated the appropriate conditions were used to allow the reporting of extended motor oil results from the original data.

The raw data was reprocessed through the Target Chromatographic data processing software to generate a paper report that includes the extended motor oil results. The upload2lims reports are included in this addendum with the appended motor oil results. This is the identical report uploaded to the LIMS. The needed information is parsed from this report, and stored in the LIMS system. Final concentrations for diesel, motor oil, and the surrogate QC compound, O-terphenyl, are included in the upload2lims reports. The concentration of a detected target compound is reported in the final concentration column of the upload2lims report. Non-detects have "ND" in the final concentration column. For non-detects, the usable reported concentration is the number in the Adj MDL column for that compound rounded to two significant figures with a "U" qualifier added. All the samples in this group were non-detects for both diesel and extended motor oil. The same QC results reported with the original LIMS final report applies to this data so they will not be reissued with this addendum. Results are summarized in the table below.



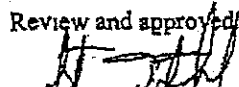
Results Summary Table

| Customer ID | Lab Sample ID | Final Diesel<br>Results<br>mg/Kg | Extended<br>Motor Oil<br>mg/Kg |
|-------------|---------------|----------------------------------|--------------------------------|
| 400SOIL-01  | W01DC00056    | 25 U                             | 50 U                           |
| 400SOIL-02  | W01DC00057    | 25 U                             | 50 U                           |
| 400SOIL-03  | W01DC00058    | 25 U                             | 50 U                           |
| 400SOIL-04  | W01DC00059    | 25 U                             | 50 U                           |
| 400SOIL-05  | W01DC00060    | 25 U                             | 50 U                           |
| 400SOIL-06  | W01DC00061    | 25 U                             | 50 U                           |
| 400SOIL-07  | W01DC00062    | 25 U                             | 50 U                           |
| 400SOIL-08  | W01DC00063    | 25 U                             | 50 U                           |
| 400SOIL-09  | W01DC00064    | 25 U                             | 50 U                           |
| 400SOIL-10  | W01DC00065    | 25 U                             | 50 U                           |
| 400SOIL-11  | W01DC00066    | 25 U                             | 50 U                           |
| 400SOIL-12  | W01DC00067    | 25 U                             | 50 U                           |
| 400SOIL-13  | W01DC00068    | 0 50 mg/L U                      | 0 95 mg/L U                    |

## II Comments

I certify that this data package is in compliance with the memorandum of understanding (MOU), both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature

Review and approved

  
Scot Fitzgerald, WSCF Laboratory Manager